SCOTTISH EDUCATION DEPARTMENT

Learning and Teaching: The Environment and the Primary School Curriculum

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A Paper by HM Inspectors of Schools —1984

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First published 1984

ISBN 0 11 492420 1

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Foreword

The Report by HM Inspectors of Schools, *Learning and Teaching in P4 and P7,*[1] called for a review of the concept of environmental studies as advocated in the Memorandum, *Primary Education in Scotland.*[2] The purpose of this paper is to contribute to that review. It argues the case for a wider interpretation of environmental studies than is found in the Memorandum; it considers the implications of this interpretation for the curriculum and schools; and it makes certain proposals. These proposals will be tested in a practical manner in a number of pilot schools in a national Primary Education Development Project.[3]

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[1] HMSO 1980.

[2] HMSO 1965.

[3] A Primary Education Development Project extending over five years was announced by the Government in June 1984. It will study and test new methods of learning and teaching in Scotland's primary schools.

1 Introduction

1.1 The publication of the Memorandum, *Primary Education in Scotland,* in 1965, stimulated a number of changes in primary schools. In particular, it focused attention on the child and his needs rather than on the subject matter to be learned and recommended that pupils be encouraged to take a more active role in their own learning. History, geography and nature study were especially affected since the approach to these subjects, until then, had been largely through class lessons and the use of textbooks. The subjects were rarely found to be related to each other and to other aspects of the curriculum or relevant to the pupils' experience.

1.2 The Memorandum did, however, note that a change in emphasis was taking place in schools. History and geography, along with science, in the form of nature study, were being regarded "less as subjects in their own right than as aspects of environmental studies". It encouraged this trend and gave the term "environmental studies" general currency by grouping history, geography and science with mathematics in one chapter under the general title of "Environmental Studies". The reason given for this was "they all in some degree involve activities which are grounded in the child's observation and investigation of his surroundings. Furthermore, they have in common the two-fold aim of fostering in the child the desire to know more about the world around him and of training him in the skills he needs to interpret it".

1.3 Fifteen years later, in 1980, the Survey by HM Inspectors of Schools, which led to the report *Learning and Teaching in P4 and P7,* established that schools had found it difficult to follow the Memorandum's advice on environmental studies. Only two out of five teachers of P4 pupils and half of the teachers at the P7 stage attached more than token importance to this area of the curriculum. Mathematics was not treated as an environmental study but regarded "basically as a matter of calculating on paper or giving oral answers to questions in mental arithmetic on tables or the like". The interpretation of environmental studies was further narrowed by a lack of attention to science and, to a lesser extent, to local and Scottish studies. Projects or centres of interest were to be found in about 75 per cent of the classes, most of them based on aspects of history or geography, but fewer than half of these appeared to be of any real significance in terms of disciplined learning. Although there was a wide consensus that environmental studies should be a part of the primary school curriculum, the status accorded to this area varied considerably among schools in the country and among the stages of individual primary schools.

1.4 It was this situation that prompted the Report to call for a review of the whole concept of environmental studies advocated in the Memorandum. Answers were required to a number of questions: "What are they, what are their limits, and what are our aims in including them in the primary school curriculum?"

1.5 In the following year the Scottish Committee on Environmental Studies, set up by the Committee on Primary Education (COPE) of the CCC, concurred with the findings of the Survey and stated that:

> "Generally speaking, however, the practice of environmental studies in schools has been haphazard, inefficient, unstructured and lacking in real commitment despite an almost universal acceptance of the need for this aspect of education in the world of today and tomorrow."[1]

In its Position Paper in 1983[2] COPE supported the view of the Report and identified environmental studies as an area of the curriculum requiring a "major initiative".

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[1] *Environmental Studies in the Primary School: The Development of a Policy* (1981).
[2] *Primary Education in the Eighties: A COPE Position Paper* (1983).

2 Learning and the Environment

In this chapter a broad view is taken of the environment and the relationship between learning and the environment is described. An approach is suggested in which the progressive development of the child's thinking about the environment, his acquisition of knowledge and understanding, his attainment of practical skills and the formation of responsible attitudes are stressed.

The Environment

2.1 This paper takes a broad view of the environment. The environment is regarded as being much more than the immediate neighbourhood or a specific physical location. The definition is extended to cover places distant not only in space but in time. It is also taken to include social relationships. The environment affects the intelligence and the senses, influences thinking, inculcates attitudes and informs values.

Learning and the Environment

2.2 The Memorandum took as its starting point the needs and interests of the child, his level of maturation, background, experience and personality, and explored his relationship to the environment in which he was growing up.

> "In the early years the child's awareness of his surroundings is vivid but undiscriminating. It is the teacher's task to encourage him to look more closely at his environment and to help him through observation and exploration to isolate, identify and understand the various aspects of his environmental experiences and to develop a language he needs to describe them".

To that could be added "and come to terms with the world in which he is growing up". A number of environmental experiences occur naturally in daily living; others have to be structured with specific objectives in mind.

2.3 Learning and the environment are inter-related in three ways. First, the environment is a resource through which the child learns, a source of inspiration and a means of enjoyment and pleasure. Within the classroom opportunities can be provided for investigation and exploration by looking, listening, touching and tasting; outside the classroom there is a host of things to observe, to hear, and to do. The use of the environment as a resource in this way to provide different situations in which skills can be acquired and exercised develops in the child the interest, motivation and incentive on which the learning process depends. Second, the environment has to be understood by the child. The school's task in this process is to help him to understand and interpret the experiences of the "real world" in which he lives and to establish the relevance of skills, knowledge and understanding acquired in the school. He has to be encouraged to interpret his surroundings through learning about the past and being made aware of developments in the present. Third, attitudes to the environment are promoted.

From his earliest years the child confronts issues that are crucial to an understanding of the world around him. Even as a very young member of society there are decisions he takes about matters which affect his behaviour and the quality of his life and that of others. For example, there are questions of litter, vandalism and protection of plants and animals. Wider issues abound. The threats to wildlife through human intervention, the decay and renewal of urban areas, and the preservation of our national heritage are only a few which demand attention. The foundations of understanding which affect community attitudes are laid in the primary school.

2.4 It will be apparent from the way the environment has been interpreted and the place it has been suggested it should be given in the learning process that there are few aspects of the primary school curriculum that are not relevant and few activities that cannot be stimulated by local studies in some form or another. The environment is something to learn FROM, learn ABOUT, and be responsive TO. Because the environment is inescapable it is difficult to exclude any aspect of the learning process or of the curriculum from the comprehensiveness of this definition. Content cannot be confined to that which can be described as historical, geographical and scientific. Moreover, the interpretation of environmental studies in terms of a limited number of subjects has in some ways constrained their development. There has been little disciplined learning in history and geography; very often they have been treated in a fragmentary and incidental way in projects. This has also been true of the relatively little attention devoted to science. The environment requires to be approached through a wider variety of disciplines. By narrowing studies of the environment to the Memorandum's four subjects the teacher misses opportunities, in the words of *Learning and Teaching in P4 and P7*, "to enhance learning by richness of context, relevance to the world around us and variety of activity".

2.5 A broader interpretation of this kind in which the child learns from the environment, about the environment and is encouraged to be responsive to the environment suggests an approach to "environmental studies" which comprises studies of the environment in their own right and a recognition of the contribution which all aspects of the curriculum can make to an understanding and appreciation of the environment.

Aims

2.6 In such an approach the aims of environmental studies would be:

(a) to contribute to the general aims of primary education e.g. the attainment of acceptable standards of literacy and numeracy by providing a suitable learning context and offering relevant opportunities for application of skills; widening the child's experience; developing his capacity to acquire knowledge independently; forming life-long attitudes to learning; and encouraging individual interests;

(b) to help the child to acquire knowledge and understanding of man in relation to his environment past and present, near and far, including not only the physical but the social environment; the beginnings of an understanding of scientific process and achievement; an appreciation of the importance of the health and safety of the individual and the community; and an awareness of the influence of different cultures;

(c) to develop in the child responsible attitudes to local and other environments, leading to an active concern for the world of nature and to an awareness of the lives of people in his own and other cultures, and fostering a sympathetic appreciation of their problems and difficulties;

(d) to bring the child to an awareness of the wonder of nature, of the pleasure and enjoyment it can give if time is taken to observe, think and use the environment responsibly; an enhanced appreciation of the spiritual qualities of truth, goodness and beauty and the ways in which these have found expression in art, architecture, music, literature, forms of worship, and other aspects of human endeavour and achievement.

2.7 Implicit in this approach is the need to plan the progressive development of the child's thinking about the environment, knowledge and understanding, attainment of practical skills and formation of responsible attitudes.

Concepts

2.8 Concepts are a general response to specific experiences which have some property in common and which exist at all levels of thought. Children learn through the formation of concepts, which lead to understanding and the ability to perform certain tasks. Concepts are constantly refined and their range extended by new experiences. Some are very specific like "field", "house", "school", "shop"; others may be outwith the child's day to day experiences such as "estuary", "hill-fort", "burial cairn", "reservoir", "glacier"; and others still are at a very abstract level e.g. "dynasty", "government", "evolution" and "conservation". Development of concepts is essential if the child is to understand the content of the curriculum. The teacher must, therefore, clarify the concepts implicit in the learning process, and, in her planning of the curriculum, make provision for their development.

2.9 Since 1965 a number of complex and abstract concepts have been identified as being particularly related to the environmental aspects of the curriculum. They are sometimes referred to as "key concepts" because they encapsulate general principles or ideas inherent in the various topics under consideration. The treatment of these topics is structured to establish in the minds of children key concepts which bring coherence and direction to the teaching of environmental aspects such as history and geography. Such identification helps teachers to evaluate their teaching and points their planning towards the development of the key concepts.

2.10 In 1979 the Scottish Committee on Environmental Studies of COPE listed nine such concepts: Adaptation, Cause and Consequence, Change and Stability, Conservation, Evidence, Independence and Inter-dependence, Location, Similarity and Difference, and Time. The wider interpretation of environmental studies referred to in paragraph 2.5 allows the inclusion of others such as Values, Beliefs, Pattern, Colour, Texture and Rhythm. No list can be definitive. Key concepts merge with each other and the differences between them and other concepts can become blurred. Because of this it is tempting to allow key concepts to take care of themselves and to assume both that they are inherent in any study and that their development is inevitable. Key concepts, however, heighten the teacher's awareness of the breadth and scope of what is being studied; offer greater insight into the ways children develop their thinking about the environment; and help the teacher to set specific planning objectives.

Knowledge and Understanding

2.11 It has been argued that it is of little consequence whether children know anything as long as they are able to find out for themselves. The amount of

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available knowledge increases so quickly that its pursuit as a relevant aim in education should be discounted. This, however, is to deny one of the fundamental aims of education: "Whatever else an educated person is, he is one who has some understanding of something. He is not just a person who has a know-how or knack".[1] While the frontiers of knowledge are continually and rapidly being extended, there is a core of knowledge which is relevant to our daily life and essential for the understanding of local, national and world affairs. In every meaningful educational experience the acquisition of knowledge and understanding is essential, and this process should be promoted in the primary school.

Skills

2.12 The emphasis on activity methods in learning has rightly encouraged teachers to be concerned about the ability of children to perform tasks associated with the knowledge and understanding they have gained. Such ability is referred to as a "skill", and it has become common practice to place emphasis on the acquisition of skills in the primary school. Lists have been drawn up, some intended to be used as checklists, to allow individual records of attainment in these skills to be kept. Skills, however, do not exist independently of the specific knowledge required to carry out particular tasks, and cannot be pursued as ends in themselves. The definition of reading as a skill is only partially true since the ability to comprehend, infer or evaluate is heavily dependent on background knowledge and experience. Again the ability to use maps effectively depends as much on knowledge of direction, scale and symbolism, as it does on the attainment of any skill.

2.13 The importance of objectives related to children's ability to carry out practical tasks is not underestimated but the ability to perform any practical task must be closely related to knowledge and understanding which in turn depend on the development of concepts. What has to be avoided is making the attainment of skills an end in itself and divorcing skilful behaviour from the related knowledge and understanding.

Attitudes

2.14 The development of attitudes was included in the aims of environmental studies as set out in paragraph 2.6. The maintenance and improvement of the quality of the environment, the preservation of what is valued in our heritage, and the making of considered judgements on environmental matters depend on the care and concern which all members of society have for each other and for the environment in which they live. Many of these attitudes are formed gradually. Although they may mature fully only in adult life, a start should be made in the primary school through the development of attitudes to such matters as healthy living, care of plants and animals, the problems of vandalism and litter and the encouragement of open-ended discussion on environmental issues and problems.

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[1] P H Hirst and R S Peters: *The Logic of Education* (1970).

3 The Nature of Studies of the Environment

This chapter considers the environment as a topic for study and the ways in which subjects in the curriculum draw on the environment as a resource and contribute to an understanding and appreciation of it.

An Environmental Study

3.1 It has been suggested so far that the world the child knows is the basis for his learning, that it provides a natural starting point for a school programme and that this programme should include studies of the environment in their own right. The school should help the child to understand and interpret experiences in the local environment and then extend his knowledge and understanding to other places, times and cultures. The focus of these studies must be on man in his environment. One approach might be: his relationship with the physical environment; the natural environment; the built environment; the management of his environment; his relationship with his fellow human beings as they live together and survive in the environment; and trade, transport and communication etc. It is essential, however, that the school programme be founded on first-hand experience by the child of the local environment which should be carefully surveyed and analysed so that its potential can be uncovered. Experiences can be arranged in a spatial hierarchy of complexity to match the child's growth in understanding. Such studies of the environment are multidisciplinary and all aspects of the curriculum have a contribution to make as well as having a continuative element to ensure their progressive development.

3.2 A number of approaches to such a multidisciplinary study in which children learn through the medium of the environment are possible. These approaches are not mutually exclusive and one may lead to another. They can gather facts, examine various aspects of the environment, record their findings and then make deductions about the quality of the environment and the direction of change. Or, a scientific approach may be adopted in which children observe, investigate, form hypotheses and test these by experiment. Alternatively, the interests of the children may be caught by the visual and aural aspects of the environment through the patterns and rhythms of the natural world and the sights and sounds of nature, or through the pleasure afforded by walking, climbing, canoeing, orienteering and other outdoor activities.

3.3 Multidisciplinary approaches of this kind can generate more detailed studies of aspects of the curriculum which can then be related to the planned programme for these aspects in the school. For example, the scientific approach may identify the need to study scientific phenomena in greater detail such as soil, growth, the nature of magnetism, the strength of materials and structures, steam and water power, generation of electricity etc. Local studies may reveal the need to investigate in greater detail specific historical periods in a national or international context, or geographical locations in other parts of the homeland or abroad.

3.4 Children are members of a wider community, that of the nation and beyond, and share common interests and challenges with people in their own country and throughout the world. The local area has to be seen as a base and not the boundary for an environmental study. Studies of environments in different parts of Scotland introduce them to the flora and fauna, the weather patterns, the seasonal activities and the variety of traditional occupations and pursuits. The countryside, islands and coastlines repay careful study, and their conservation is a matter of national concern. There is the treasure house of folksong and traditional country dancing and the rich tradition of invention and craftsmanship to share with children. Equally important is the cultural heritage embodied in verse and prose. Studies can lead to investigative research of local records and examination of historical evidence. Carefully selected aspects of these can be used to lead to an understanding of Scotland's past and the times at which Scots formed communities or dynasties each with its own life-style, customs, literature and songs.

3.5 By studying their neighbourhood and comparing it with other areas of Scotland and the environments of other people in other lands, children learn something of how their own and other societies function and of their cultural, political and economic similarities and differences. They learn where places are, what they are like and the conditions of life in them. Thus, they are introduced to the ideas of distance, direction, time and travel, the concepts of favourable and unfavourable locations and the inter-relationship of man, plants and animals etc. Through contrast and comparison they come to an appreciation of the interaction of man and his environment and of the social and physical aspects of environment in countries other than their own.

3.6 The environment is constantly changing. Sometimes children have experienced rapid change such as the building of a new town or the demolition of buildings in a city centre; sometimes these changes are more difficult to perceive because the pace is slower. In any local study a question of fundamental significance is: how did the environment become like this? Evidence has to be sought, current problems and issues identified and predictions made about the future.

3.7 These problems and issues are not confined to the local area or, indeed, to the homeland. Studies of the environment have to deal with problems and issues which are world-wide such as the effects of technology, the exploitation of energy resources and famine in the Third World. There is a place for these studies in a planned programme. The programme has also to be flexible enough to enable it to respond to incidents and contemporary events which catch the interest of the children and the teacher.

The Environment and the Subjects

3.8 Multidisciplinary studies of the environment do not exhaust the ways in which individual subjects draw on the environment as a resource or contribute to an understanding and appreciation of it. Nor do they ensure a structured, progressive and systematic approach to the development of children's thinking within the recognised areas of the curriculum. The school programme has therefore to be considered in terms of the development of various forms of understanding associated with these areas. If this is not done many of them may appear only incidentally e.g. history arising from the study of a novel, art illustrating a topic.

3.9 This chapter now considers in detail how science, history and geography relate to the environment. This is because they were included in the Memorandum as "environmental studies"; they were identified in *Learning and Teaching in P4 and P7* as comprising an area of the curriculum where a major initiative was needed; they contribute signally to the aims of environmental studies as suggested in paragraph 2.6; and they focus on and make a unique contribution to the study of man in his environment. Because of this focus on man, health education, which includes studies of the human body, its growth, development and well-being, is considered with these three subjects. Later paragraphs of the chapter give a briefer indication of the relationship which exists between the environment and other aspects of the curriculum.

(i) *Science*

3.10 Children may appear to be familiar with science and technology in the home, in school, in their own exploration of the environment and through the media. Although they seem to adjust to the speed of technological change with ease their knowledge and awareness of the inherent scientific ideas and processes are often less secure and more transient than is thought. This imbalance must be redressed through the provision in each school of an identifiable science component in the curriculum.

3.11 Science contributes to children's learning by helping them to approach any issue or problem in a scientific manner, by increasing their knowledge and understanding of the natural and physical world and by giving them insight into specific processes and discoveries. Science is essentially a method of enquiry which involves direct experience, fosters observation, and encourages children to look for relationships and patterns which can then be tested by experiment and further observation. In this way knowledge and understanding about man and his environment are acquired. As the range of scientific experiences extends, interests and attitudes develop. Increasing awareness of the application of science enables children to sense that it both shapes and is shaped by our culture. Progressively an awareness is developed of the historical, social and economic aspects of science and of its relevance to political decisions and ethical questions concerning man's impact on his environment. Children come to see how the physical and biological sciences contribute to technology in the world of work and use what they learn to solve practical problems.

3.12 The topics chosen should help children, as they progress through the school, to acquire a deeper understanding of science through the study of content from the major areas listed below. It is important that the topics contain opportunities for first-hand experience, are of interest to children and reflect a balance among the following:

(a) Living things and their environment: an appreciation of the characteristics and variety of living things, their life-cycles and relationships; observation of animals and plants through seasons; investigation of factors which support life such as water, air, light, weather and soil.

(b) Materials: properties, uses and sources of various every-day materials such as timber, metals, fibres, plastics and paper; aspects of the environment such as buildings and the properties of the materials of which they are constructed; simple model making and experiments through topics such as bridges and flight; and the use of modern constructional toys.

(c) Energy matters: experiences of human movement and an appreciation of the ideas of pushing, pulling and twisting, leading to the development of the concept of force at a later stage; investigation of things that roll, slide, wheel, float or fly, the recognition of energy changes involved in simple situations, leading at a much later stage to a fuller understanding of energy including an awareness of the need to conserve it; and work on sunlight and shadows leading to a study of the solar system.

(d) Ourselves: the external and internal structure of the human body; the operation of skeleton and muscles, and the working of the main organ systems; the development of the body; food and diet; and behaviour that promotes health and safe patterns of living.

(ii) *Health Education*

3.13 Health education is concerned with the development of an understanding of the workings of the human body and of the effects on bodily well-being of habits, practices and environmental influences. It is demonstrated by example and the maintenance of a healthy environment as well as by learning and teaching about healthy living. Through health education the continuing health of the individual and the community is promoted by ensuring that young people are fully informed about and encouraged to adopt a positive attitude to health matters. In school, health education is provided through the practice of responsible health habits, physical and recreative education, including informal and extra-curricular activities, and planned health studies in the curriculum. It also depends on the overall quality of the tone of the school; human relationships in the school; and the degree of educational success achieved by pupils, since all of these affect their confidence, satisfaction and motivation.

3.14 Many topics in other parts of the environmental studies programme provide a context for health education. For example, studies of food and farming are related to nutrition and diet; an "ourselves" theme in science is concerned with the structure and functions of the human body; and a study of transport raises considerations of safety. Health studies cannot be left unplanned, however, and this was stressed in the *Report on Health Education* by HM Inspectors of Schools in 1979: "Schools need to reflect upon the limits of their largely opportunistic approaches and develop health topics as centres of interest in a planned sequence".[1]

(iii) *History*

3.15 History is an enquiry into human activities in the past, the thoughts, motives, character and actions of people, together with a record and evaluation of these activities. In the primary school the emphasis is on people and those achievements and experiences which are relevant to our society. Children are introduced to their cultural heritage and are helped to compare and contrast their life with that of people in other times. They begin to understand some of the ways in which the past can be reconstructed through the use of source material and to appreciate the importance of evidence and its use in making judgements about events. With encouragement they ask relevant questions and draw their own conclusions from the examination of artefacts and accounts written from different standpoints. Historical studies thus illustrate the process of change, the effect of past on present, the response of man to conditions at different periods of time and his effect on changes in the environment.

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[1] *Health Education in Primary, Secondary and Special Schools in Scotland.* HMSO (1979).

3.16 In the early stages the idea of change is illustrated by the telling and reading of stories, by incidental references to the past in topics and by a discussion of current events. The choice of content is not crucial. What is important is that pupils be given the opportunity to explore and discuss evidence through everyday objects and artefacts, local buildings, clothing and utensils, and by talking with older people about life in their time. Through this they develop a sense that life in the past was different, that there were different ways of living at different times, and begin to understand key concepts such as change and stability, similarity and difference. They also begin to notice the diversity of human response to events by hearing stories and asking "why" and "how".

3.17 In the later stages, pupils can develop a more precise and systematic approach either through "patch studies", which involve the judicious selection for study in depth of people living in a community at a particular point of time, or through "lines of development", which involve studies of change and development taking place over a longer time span. This enables them to develop more accurate ideas associated with change, contrast, motivation and to ask questions about sources and to make reconstructions. But history is not confined to patch studies and lines of development. A historical element, as has been pointed out, can figure prominently in a local study, and in the study of current issues the historical background is important. References to historical events can often be found in novels, stories and poems. All of these should be used to extend the pupils' background knowledge of history and develop their understanding.

3.18 Although there is considerable scope in the choice of content, criteria for selection should include the location of the school; the need to emphasise the Scottish and world dimension; important points of change affecting man and society and illustrative of his response to his environment; and opportunities for comparison and contrast. In terms of broad epochs the criteria would point to the need to include both patches and lines of development based on pre-history and early civilisation, medieval society, the age of exploration, the age of industrialisation, and the twentieth century. It is accepted that children have difficulty with the concept of time, a difficulty sometimes shared by adults. This should not inhibit teachers from attempting to establish a historical chronology or sequence of events so that the pupil leaves the primary school with a framework and structure of major historical periods to which he can relate his subsequent learning.

(iv) *Geography*

3.19 Before coming to school, children have already begun to be aware of the relationship between objects in time and space. In the early stages of the primary school, observation of surroundings, pictures of other places, experience of travelling, and stories of life in other lands lay the foundation for more systematic studies later. The planned extension of knowledge of the local environment is an essential part of the work in the upper part of the school. As suggested in paragraph 3.5 this should include the sequential study of areas of increasing complexity which may be contrasted with areas of similar size in other parts of the homeland and abroad. These are often called "sample" or "case" studies. Within such studies it is important that the local area and its community are prominent, and that children consider topics like the home, the school, the street, the shopping area, the housing estate, and then progress to farm and forest, village and town, river valley and island. When these studies are related to Scotland as a whole a careful selection of a number of areas will provide a basis for comparison and contrast. The choice depends a great deal on the children's home area and the nature of the work already undertaken. For example, children in a Highland village may contrast their location with a village on the outskirts of a large city; those on inland locations with coastal sites; and those in a river valley in a rural area with a similar situation in an industrial area. In addition, through these studies and by other activities designed specifically to increase general knowledge, the general features of Scotland and contemporary Scottish life are learned.

3.20 The selection of sample studies in the wider world leaves considerable room for choice. Locations in the British Isles and other EEC countries; cultures very different from our own; locations in the Third World and in major countries; and a variety of climatic zones and terrains should be included. These studies are to be seen in a world context. Both local and world studies should be closely related to work with globes, maps and atlases which are in effect both a form of representation and tools useful for extending an understanding of the environment.

(v) *Mathematics*

3.21 Mathematics was the fourth environmental subject identified in the Memorandum. Although, since that time, it has been studied in schools largely as a separate discipline this does not invalidate the Memorandum's contention that "even in mathematics the environment is the base from which the pupils will set out on their explorations further afield, and to which they most frequently return". Material for practical activities in computation is to be found everywhere in the world with which the child is familiar. This brings relevance and interest to his work and helps to enhance his understanding of number. Recordings of environmental phenomena find expression in tables, graphs, histograms and pie-charts. Scientific investigations involve measurement, and the visual aspects of the environment lead to a consideration of shape, design and symmetry. To structure a mathematics programme that is not closely related to the environment is to miss valuable opportunities for mathematical insights.

(vi) *Language*

3.22 Language reflects the culture of a society and is therefore a major factor in the study of environment; local dialects and accents are part of our social environment and our cultural heritage. Both prose and poetry have an important part to play. They can reconstruct historical situations, illuminate geographical contexts, throw light on past and present issues, awaken emotion and inspire action. It is common practice for the study of a novel to proceed side by side with and complement that of an environmental topic and this can be a valuable source of inspiration for a historical study or an investigation of a distant land. Although a novel can enrich and enlighten such studies or investigations it cannot be the sole source of material or the basis of a programme for the study of historical periods, geographical locations or scientific discoveries.

3.23 Studies of the environment afford natural opportunities for pupils to ask questions, to pass on information and to exchange ideas. They provide interesting purposes for reading, relevant contexts for written communication and aid an understanding of language structure.

(vii) *Art and Craft*

3.24 The expressive arts were viewed in a recent COPE paper[1] as a distinctive way of leading the child to explore and interpret the world. In one of the many sets of education authority guidelines the point is made more specifically about art: "the exploration of the environment and enriching experiences are of central importance and are yardsticks against which judgements about relevance, suitability and quality are measured . . . They involve a process of knowing, and in order to know one must explore; in order to understand the environment one must explore it visually".[2]

3.25 Images can have a lasting impact on learning experiences. Drawing, painting and photography are invaluable aspects of environmental investigation and they have a capacity to sharpen the ability to learn by observation and to assimilate and select relevant material and experiences. Since environmental studies is as much concerned with man's responses to the environment as with the acquisition of knowledge and understanding the visual medium also takes its place alongside language as an expressive outlet of great significance. How people feel about the environment, how they adjust and relate to it, and how they shape and influence it have been major sources of stimuli for art through the ages. These stimuli are equally relevant in children's art, and opportunities to respond to them can strengthen the feeling of involvement and self-identification with many aspects of their daily life.

(viii) *Music*

3.26 Wherever and whenever groups of people have settled together, music has been an integral part of their lives and an important means of human expression and communication. It stimulates imagination by creating mood and atmosphere; it is a potent medium of social comment, communication and influence; it serves as a vivid documentation of the history and changing social conditions of the lives of Scottish and other peoples; and it reflects local traditions and ethnic characteristics. Music which is evocative of environmental features and characteristics helps children to interpret more perceptively their own surroundings, emotions and experiences. For that reason provision for the exercise of imaginative, creative and inventive powers of musical self-expression has to be made in the classroom.

(ix) *Physical Education*

3.27 Physical education contributes to children's growing understanding and awareness of their environment. The type and variety of physical responses they are required to make in various locations, with different equipment, and in changing group sizes, places a premium on their skill and adaptation. Through engagement in many forms of movement, children have to reveal their knowledge and understanding, display their skill and daring, demonstrate their inventiveness and communicate expressively. Beyond the confines of the classroom and the boundaries of the school lies a world increasingly explored through outdoor pursuits by children in the primary school. Orienteering has an important part to play by combining movement across the countryside with the use of maps and compasses and the development of understanding through observation. Finally, the culture of a society is reflected in its national dance, sports and leisure pursuits and in the degree of importance it attaches to the health and fitness of its people.

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[1] *Scottish Committee on the Expressive Arts: Towards a Policy for Expressive Arts in the Primary School* (1980).

[2] *A Guide to Art Education in Primary Schools: Grampian Regional Council Education Department* (1983).

(x) *Religious Education*

3.28 The values and beliefs held by a society play a significant part in shaping the patterns of living and the physical environment of that society. Churches, towers and cathedrals, abbeys and monasteries are part of the everyday environment, and religious festivals of the various faiths play a rich and often colourful role in daily life. An understanding of religion is based to a large extent on the reconstruction of historical situations and a knowledge of the lands where great religious movements took place. Religious persuasion may affect the interpretation of history and colour views of scientific philosophy. At a deeper level, religious belief affects attitudes to environmental matters. Care for the welfare of others in the community and the development of multicultural understanding may stem from faith, and customs and traditions which form part of our heritage are rooted in religious faith and practice. The consideration of many current issues cannot be divorced from religious belief: often they lie at the heart of conflict and tension.

3.29 A relevant context is provided through environmental studies in which the moral responsibility inherent in man's stewardship of the environment should be stressed. This involves the development of respect for others and for other forms of life and of a sensitivity to their welfare and needs.

4 Curriculum Design and Methodology

This chapter discusses the design of the curriculum and the progressive development of studies of the environment, considers the balance in the curriculum and suggests an appropriate methodology.

Design

4.1 The design of the curriculum must reconcile the multidisciplinary environmental study with the contribution individual subjects make to knowledge, understanding and appreciation of the environment and provide for the progressive development of the subjects themselves. A distinction can be made between three categories of curricular experiences.

(a) *The general topic* i.e. one which involves elements of more than one subject and serves to advance the child's knowledge and skills in more than one field. It is multidisciplinary, embracing many branches of the curriculum. An environmental study is essentially multidisciplinary and is therefore one of the general topics.

(b) *The subject-based topic* e.g. a patch study in history or sample study in geography. Learning in this case is much more subject-orientated. Though peripheral activities may be relevant, they are pursued only insofar as they illustrate the focal studies and contribute to a general understanding and appreciation both of the environment and of the subjects.

(c) *A sequential series* of lessons in aspects of the curriculum e.g. elements of reading, handwriting, arithmetic, map reading, the use of books, musical notation and gymnastics. The teacher may decide to provide a programme of learning experiences in this systematic way in any aspect of the curriculum. For example, in history there may be a series of broadcasts or a number of class lessons; in geography a series of stories from other lands; or in science a set of scientific experiments. It is in this category that much of the work in the primary school is presently found, though it is the contention of this paper that more should be dealt with in general and subject-based topics. There is a view, for example, that the only way to establish science in the curriculum is to confine it to this third category and model it on the development of mathematics. This, however, deprives the child of the opportunity to become aware of the importance of the scientific approach in other studies and it obscures the contribution of science to an understanding of the environment in general.

4.2 These three categories of curricular experiences are closely inter-related and, indeed, often merge in the child's experience. The first can generate work in the second: the study of a farm, for example, leading to a patch on the first farmers, or the study of the effect of different soil and weather conditions on growth; or the study of a village in Scotland leading to a sample study of a village abroad. Both provide a good context for the practice and development of language, mathematics and the expressive arts. The child's experience in the first two categories can reveal the need for the kind of systematic attention outlined in the third. Coverage of each aspect of the curriculum can be monitored by reference to education authority guidelines.

Progression

4.3 Studies of the environment have to proceed in a systematic way and be structured in a logical fashion so that the child retains interest and progresses in his understanding. The sequence should be related to age and maturity. The young child is interested in his immediate surroundings and in imaginative play with toys that simulate the world he knows. He becomes aware of plants and animals and learns to care for them. He finds out about transport and road safety, about people who help him. He enjoys stories of children in other lands and of other times. Play activities lead to experience of materials and structures and to ideas of weight, length, capacity and time. The child is interested in himself and the people who impinge upon his life. His imagination is stimulated by stories of space-craft and astronauts, of great adventures and lands full of mystery. Content has to be responsive to his interests and provide a wide scope of activities and opportunities for observation, talk and active investigation.

4.4 In the later primary years material becomes more ordered. The study of space leads from the near at hand to the distant, from the simple to the more complex, from the present to the past. The child gradually comes to realise the nature of settlements and their differences, the variety of land uses and the reasons for these, and develops an increasing awareness of the sequence of historical periods and how ideas about the past are established. He poses problems, asks questions and constructs experiments to find out about the natural and physical world. He develops an awareness of order, rhythm, pattern, colour and texture and perceives variety in shape and design. Above all, feelings of awe and wonder grow and ideas of responsibility and stewardship develop.

Balance

4.5 Balance in the curriculum is an elusive concept, difficult to measure. In view of this paper's broad interpretation of environmental studies it will be apparent that it is undesirable to make a recommendation about the proportions of time that should be allocated to the various areas of the curriculum. Such a recommendation might, in any case, encourage the fragmentation of the curriculum, and relegate and confine some areas to a position of minor importance. Moreover, the time spent on any activity is educationally less significant than the quality of the children's experience which is derived from it. Nevertheless, it is important that each area be given adequate attention and one should not be emphasised at the expense of another. Other aspects of balance have to be taken into account: the content of each subject area; the amount of work that falls into each of the three categories of curricular experiences (paragraph 4.1); the range of key concepts and opportunities to practise skills in each of the topics; and the variety of methodologies deployed. A balance is only likely to be maintained if there is an overall plan for the school, based on programmes for each area of the curriculum, and if staff constantly review the position and make adjustments to the work in each area.

Methodology

4.6 Central to the methodology of studies of the environment is the provision of first-hand experience in fieldwork for pupils. Pupils observe, measure and carry out simple experiments and make deductions. They may also interview people in the community. The results are recorded immediately in the field, or during and after an experiment in the classroom, by noting data for later presentation and analysis. Recording may take a number of forms: numerical and graphical representation, field sketching and simple diagrams and, very often, oral and written description. In this activity there is a place for the use of tape-recorders and cameras of various kinds. Recording sometimes involves relating first-hand observation closely to the kind of information provided in reference books.

4.7 Careful planning helps to minimise the risks to pupils and damage to the environment inherent in some kinds of fieldwork. Care has to be taken in the collection of specimens, and the plants and animals collected for later study should be properly looked after in transit, in the classroom itself, and subsequently on their return to their habitat. Only through the consistent practice of such a code can teachers lay a sure foundation of future behaviour and attitudes which will foster in pupils a proper regard for the conservation of wildlife.

4.8 Fieldwork is only one aspect of methodology. In the classroom pupils may promote a great deal of their learning by the reconstruction of environments: visually and through drama, by handling and discussing everyday objects, by experimenting, by listening to stories, by viewing television and listening to radio broadcasts, and by interviewing adults invited to the school. Data is assembled by using pictures, films, broadcasts and books, and the material is then analysed, selected and collated. The role of discussion at this stage is also very important. A methodology which relies mainly on learning facts from textbooks, copying information into a jotter or filling blanks in a paragraph of prose does not encourage the development of enquiring minds.

4.9 Another approach to a topic in the classroom is based on a hypothetical model. The aim is to establish key concepts by posing problems and identifying issues which encourage pupils to think for themselves rather than to accept ready-made solutions. It is usually centred on a large diagram, map or model, and can lead to interesting and fruitful work in terms of discussion, art and craft, drama, reference work and the study of literature. Teachers should preferably produce their own materials, however, and select topics which are appropriate to the overall curriculum design and related to the environment the pupils know.

4.10 The process of recording the findings of investigation involves pupils in a great deal of practical work in language, mathematics and the expressive arts. They are motivated in this activity if they can share the results of their work with the other classes in the school, parents and friends, neighbouring schools, and, perhaps, the general public. There is also value in corresponding with schools in contrasting environments and sharing the results of investigation with them.

4.11 Both in fieldwork and class work one of the main challenges constantly facing the teachers is to vary the work to match the differing abilities of the pupils. The needs of pupils with learning difficulties pose particular problems in this respect, as the Inspectorate Report[1] highlighted. It is, however, in the study of the environment above all that such pupils are very likely to discover things which engage their interest and which give them that confidence without which the teacher's task is made more difficult. One of the aims of the Primary Education Development Project will be to prepare, as necessary, new materials for teachers and pupils which match the varying interests and abilities of the pupils.

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[1] *The Education of Pupils with Learning Difficulties in Primary and Secondary Schools in Scotland: A Progress Report by HM Inspectors of Schools,* HMSO (1978).

5 The School

Some practical implications for primary schools of learning in the environment and of the wider interpretation of environmental studies are discussed in this chapter.

The Programme

5.1 Each primary school can plan its overall curriculum in the light of the importance this paper has attached to the place of the environment in learning and to the wider interpretation of environmental studies. The previous chapter proposed a course of action. This calls for the preparation of a coherent planned programme of work for each stage of the primary school. Within the framework of that programme there should be opportunities for the teacher to experiment and develop her own special interests and those of the class as well as responding to important contemporary events. One of the purposes of the Primary Education Development Project will be to produce programmes of work in a number of pilot schools.

5.2 In planning a topic within the programme the following should be considered:

(i) the contribution it makes to the aims of environmental studies within the overall aims of the primary school;
(ii) the relationship to what is being done at other stages, particularly those which immediately precede and follow;
(iii) the specific outcomes to be achieved in terms of key concepts, knowledge, skills and attitudes, and the assessment procedures to be adopted;
(iv) the aspects of the curriculum it represents;
(v) the ways it relates to the sequential development of subjects;
(vi) the opportunities it presents, through relevant contexts, for the development of speaking, listening, reading and writing.
(vii) the ways it involves the pupil in practical measurement, computing and analysis of numbers; appreciation of shape and the use of pictorial representation; the development of ability to use diagrams, maps and charts;
(viii) the opportunities it affords for the child to develop techniques and make expressive responses in art, music, movement and drama;
(ix) the importance of the scientific approach in the learning process;
(x) the place of field visits; and
(xi) the end product in terms of individual work and classroom display.

5.3 The main criteria for choice of topic will include the location of the school; the catchment area from which the pupils are drawn; and the need to provide a context for the systematic development of thinking and attainment within the recognised aspects of the school curriculum. The number of topics to be studied in the course of a session will depend on the age of the children, the interest the topic arouses, and its implications for progression in environmental understanding. In the early stages children are likely to be involved in many topics of short duration. Later they may study three or four major topics per session, one of which should be a local study. These may be supplemented by minor topics, aimed at extending and broadening the children's experience in areas not arising in their major topics.

5.4 In planning the programme it is essential that the headteacher should give all members of staff an opportunity to make a contribution. In this way teachers may appreciate more fully the essential part they play in the formulation of the overall strategy and the tactics to be deployed. The assistant headteacher has a key role in this process in helping individual teachers to plan particular topics, and in co-ordinating the progression of work from stage to stage. It is for her to explore the possibility of teachers at the same stages working together, with, if appropriate, an input from teachers at other stages. The headteacher may also wish to delegate to her the planning and organisation of fieldwork, liaison with external agencies and the responsibility for the allocation and efficient use of resources.

Resources

5.5 *Learning and Teaching in P4 and P7* considered that support was required "to give teachers confidence, security and the conviction that what they were asked to do is practicable". First in importance are the resources already in the school in the form of qualifications, expertise and interests of the staff. The wider community can also provide support, for example, not only through contributions from nurses, policemen, firemen and farmers but also through the detailed knowledge and recollections of parents and grandparents of local and sometimes distant environments.

5.6 The environment itself is rich in the resources it offers for specific studies. Castles, forts, burial grounds, ponds, streams, railway stations and nature trails can all be starting points, as can local events, customs, festivals and traditional crafts. Items in the local newspaper, such as the building of a bypass, the closure of a railway line, the demolition of a building or the filling of a gap site, can become topics for discussion.

5.7 It is suggested that the headteacher should catalogue and assess the material resources of the school and take account of what is available in libraries, local authority planning departments, museums, education authority resource centres, secondary schools and from national and other organisations which are concerned with promoting the educational aspects of particular interests. Correspondence with other schools, both in this country and overseas, can bring information and materials from pupils in different environments which carry authenticity and stimulate interest.

5.8 Resources, particularly printed materials, have to be appropriate for use by the wide range of ability in the classroom, catering in particular both for gifted pupils and those with learning difficulties. Workcards and worksheets have become very popular; some are produced commercially, others are made in the schools. The latter have the advantage of being able to take account of the range of ability in the classroom and exploit the characteristics of the local environment. The best use to which these can be put is the promotion of active investigation and experimentation. The growing availability of facilities for recording radio and television programmes gives teachers more control over the benefits of the media and allows them to fit selected broadcasts into the school syllabus at appropriate times. Although annual programmes published by the broadcasting companies are important aids in planning they cannot be substitutes for a carefully worked out school programme. In addition, there is much to be said for children making their own arrangements, by using cameras and recording equipment in a creative way, and for the production of illustrated reference books and tape-slide presentations.

5.9 It is still too early to assess the full impact of micro-technology. Current practice suggests that uses of the micro-computer include the presentation of information and the opportunities for learning and teaching specific areas of knowledge and for problem solving; the cataloguing, classification and identification of environmental phenomena; the processing of data gathered in investigations; and the construction of maps and diagrams, and other forms of pictorial representation, to help in the understanding of mapping techniques.

Record Keeping and Assessment

5.10 It is important that records should be kept of the work in each class. Passing these from teacher to teacher as the pupils progress through the school makes it easier for future work to be planned in the light of the pupils' previous experience. Records require to be examined periodically to check the balance of work so that the planned programme can be modified if necessary.

5.11 Assessment is an integral part of the learning process and should be directed towards describing what has been achieved by the individual. Very often a simple and single observation of the pupil or group or class at work will assure the teacher that the lesson has been learned and the next step in the process can be taken. At other times direct questioning will tell her all she needs to know about an individual's progress. Such formative assessment is essentially ephemeral in nature, and need not be recorded. Where information about pupils' progress has to be communicated some more summative assessment is necessary, and the results of this should be recorded in some way, usually in the form of a profile of words.

5.12 As noted in paragraph 5.2(iii) an essential part of the teacher's planning of a topic is a statement of the outcomes of the learning activities, with, where appropriate, different levels of acceptable performance. In most activities this will amount to statements of what the pupil can or cannot do. Once it is clear both to teacher and pupil what the outcomes are, the most appropriate measuring instrument has to be selected to determine whether the outcomes are being achieved. This could be the pupil's written work e.g. a report on an investigation or an experiment; a short sequence of objective test items to assess knowledge and understanding; an observation grid to be completed by the teacher as she watches pupils go about the tasks she has set. Whatever form it takes, it must be valid, and test what is being learned. It should also be commensurate with the pupils' ability to respond effectively by seeking out what they can do rather than what they cannot do.

5.13 Little of this is new to the primary school and teachers have frequently used such testing in an informal way. Thought has now to be given to introducing more formality, and one of the tasks of the Primary Education

Development Project will be to create the elements of an effective assessment and reporting system in environmental understanding and appreciation which teachers can use with confidence.

Transition to Secondary School

5.14 The CCC's Programme Directing Committee on Education 10–14 is due to report to the CCC by June 1985. The difficulty of their task is plain enough. In going from the primary to the secondary school pupils can move from having one teacher to perhaps 16 and to an organisation in which every subject is studied every week in the year. The following three points about the transition stage are particularly important. First, what has been claimed for the importance of the environment in learning and teaching in the primary school is equally valid in its application to the secondary school. Second, the aims of environmental studies in the primary school can be shared by the secondary school. Third, it is wasteful of the time and resources of both the primary and secondary schools if the latter ignore what has already been learned when pupils transfer and begin afresh.

5.15 There is growing exchange of information between primary and secondary schools about pupils and courses. Because of this there may be less danger of pupils repeating in S1 what they have already studied in P7. Encouraging as this is, however, it does not guarantee two essential prerequisites of smooth transition, viz. continuity in the curriculum and the methodology which pupils experience between the ages of 10 and 14. The suggestions made in this paper for the systematic development of subjects go some way to achieving the first, though it is appreciated that it may prove difficult for the secondary school, with its present organisation, to include multidisciplinary environmental topics in the curriculum. As far as the second is concerned, pupils in the primary schools are becoming more active in their own learning, self-motivated and independent, and accustomed to exercising a degree of choice in their activities. It is hoped that secondary schools will continue an approach based on this methodology.

5.16 More than an exchange of visits and dialogue between the staffs of primary and secondary schools is therefore required. Co-operation often develops most fruitfully when founded on practical joint exercises. Studies of the environment offer the opportunity for the staffs in both types of schools to work together in the assessment of the potential of the local environment and to share resources and expertise. This kind of initiative would lead to fuller and more informed discussion of curriculum planning.

6 Summary and Future Action

This chapter summarises the salient points in the paper and gives further details of the national Primary Education Development Project.

6.1 The paper encourages teachers to take a broad view of the environment as something to learn FROM, learn ABOUT, and be responsive TO, and its place in the learning process is highlighted. All aspects of the curriculum, to a greater or lesser extent, draw on the environment as a resource and contribute to an understanding and appreciation of it. Confining studies of the environment arbitrarily to science, history and geography unduly circumscribes the interpretation of environmental studies; attenuates the relationship between learning and the environment; and may constrain the proper development of these subjects.

6.2 The aims of environmental studies are to contribute to the general purposes of primary education, including the attainment of acceptable standards of literacy and numeracy by providing suitable learning contexts and offering relevant opportunities for the application of skills and the formation of positive life-long attitudes to learning; to motivate and help the child to attain knowledge and understanding of man in relation to his environment past and present, near and far, and to introduce to the child the scientific process of discovery and achievement; to develop in the child an active concern for the well-being of living things and people; and to foster in the child responsible attitudes to the environment.

6.3 Learning from and about the environment is not only concerned with the acquisition of factual information but with the promotion of children's thinking about the environment through the attainment of key concepts and the development of practical skills and responsible attitudes. True knowledge and understanding, the acquisition of which is essential in any meaningful educational experience, embrace all these facets of learning.

6.4 The environment itself is a topic for study. Because of the child's natural interest in the world in which he lives and about which he is always learning the local environment provides the starting point for a school programme. The programme should then offer opportunities for the extension of his knowledge and understanding to other places, times and cultures. The focus is on man in his environment, how he adapts to, manages, controls and sometimes endangers it. The studies are multidisciplinary.

6.5 The curriculum has to be designed to reconcile the environmental study and the systematic development of the child's thinking within the recognised areas of the curriculum. This leads to the identification of three kinds of curricular experience: the general topic, the subject-based topic, and the sequential series of learning steps. The work already suggested in education authority guidelines on different aspects of the curriculum should now find a planned context in each curricular experience.

6.6 Methodology should include first-hand experience in the environment through fieldwork and the simulated reconstruction of environments in the classroom.

6.7 Schools should review their policy and practice in the light of the importance of the environment in learning and of the wider interpretation placed on environmental studies. It is essential that schools should prepare a coherent planned programme for each stage of the primary school. Headteachers should engage all members of staff in the preparation of this programme. The assistant headteacher has a key role to play in planning and supporting teachers. Resources have to be appropriate for use by pupils of differing abilities. The importance of collaboration between the primary and secondary school to secure continuity in curriculum and methodology is stressed.

6.8 A national Primary Education Development Project will begin in session 1984–85. Its purpose is to produce programmes of work representing practical approaches to the proposals outlined in this paper. The focus will be on organising studies of the environment based on science, health education, history and geography. This area of the curriculum has been chosen because it was identified in *Learning and Teaching in P4 and P7* as a priority for improvement and development. Feasibility studies will be carried out in a number of pilot schools to test the approaches; to find out the most effective way of using existing materials; to prepare, as necessary, new materials for teachers and pupils which match the varying interests and abilities of the pupils; and to devise an effective assessment and reporting system on pupil progress.

Printed in the UK for HMSO
Dd. 762044/4495 C70 9/84 (13129)